We Claim:

1. A method of treating Type I or Type II diabetes in a mammal in need thereof comprising implanting a cell line transformed with a vector comprising a promotor driving expression of a DNA sequence encoding a protein of the formula:

His-Xaa^1-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Val-Ser-Ser-Tyr-Leu-Xaa^2-Gly-Gln-Ala-Ala-Xaa^3-Xaa^4-Phe-Ile-Ala-Trp-Leu-Val-Lys-Gly-Arg-Xaa^5 **(SEQ ID NO 1)**

wherein

Xaa^1 is Ala, Gly, Val, Thr, and Ile;
Xaa^2 is Glu, Gln, Ala, Thr, Ser, and Gly;
Xaa^3 is Lys, and Arg;
Xaa^4 is Glu, Gln, Ala, Thr, Ser, and Gly; and,
Xaa^5 is Gly-OH or is absent;

into said mammal such that it is immunologically isolated from the mammal's immune system and secretes a protein of SEQ ID NO. 1 into said patient.

2. A method of treating Type I or Type II diabetes in a mammal in need thereof comprising implanting a cell line transformed with a vector comprising a promotor driving expression of a DNA sequence encoding a protein of SEQ ID NO 1 into said mammal wherein said mammal is under immunosuppression therapy.

3. The method of Claims 1 or 2 wherein Xaa^1 is Ala or Val, Xaa^2 Glu, Xaa^3 is Lys or Arg, Xaa^4 is Glu, and Xaa^5 Gly-OH or is absent.

4. The method of Claims 1 or 2 wherein Xaa^1 is Ala, Xaa^2 Glu, Xaa^3 is Lys, Xaa^4 is Glu, and Xaa^5 Gly-OH.

5. The method of Claims 1 or 2 wherein Xaa^1 is Val, Xaa^2 Glu, Xaa^3 is Lys, Xaa^4 is Glu, and Xaa^5 Gly-OH.

6. The method of Claims 1 or 2 wherein the promotor is a viral promotor.

7. The method of Claims 1 or 2 wherein the promotor is a metallothionein promotor.

8. The method of Claims 1 or 2 wherein the DNA coding sequence is

5' - CAT GCT GAA GGG ACC TTT ACC AGT GAT GTA AGT TCT TAT TTG GAA GGC CAA GCT GCC AAG GAA TTC ATT GCT TGG CTG GTG AAA GGC CGA GGA - 3'. **(SEQ ID NO 2)**

9. The method of Claims 1 or 2 wherein the DNA coding sequence is

5' - CAT GTT GAA GGG ACC TTT ACC AGT GAT GTA AGT TCT TAT TTG GAA GGC CAA GCT GCC AAG GAA TTC ATT GCT TGG CTG GTG AAA GGC CGA GGA - 3'. **(SEQ ID NO 4)**

10. The method of Claims 1 or 2 wherein the cell line is the human embryonal kidney cell line 293 transformed with a vector selected from the group consisting of pGT-h+tLB+GLP-1, pGT-h+tLB+Val8GLP-1, or pMT-h+tLB+Val8GLP-1.

11. The method of Claims 1 or 2 wherein the cell line is the human embryonal kidney cell line 293 transformed with the vector pGT-h+tLB+GLP-1.

12. The method of Claims 1 or 2 wherein the cell line is the human embryonal kidney cell line 293 transformed with the vector pGT-h+tLB+Val8GLP-1.

13. A method of treating Type I or Type II diabetes in a mammal in need thereof comprising injecting an expression vector of any one of Claims 1 to 12 directly into the mammal such that the expression vector is incorporated into a cell of the mammal and secretes a protein of SEQ ID NO. 1.

14. A stable transformed cell line of any one of Claims 1 to 12.

15. A vector of any one of Claims 1 to 12.

16. A method of treating Type I or Type II diabetes in a mammal in need thereof comprising implanting a cell line transformed with a vector comprising a promotor driving expression of a DNA sequence encoding a protein of the formula:

His-Xaa^1-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Val-Ser-Ser-Tyr-Leu-Xaa^2-Gly-Gln-Ala-Ala-Xaa^3-Xaa^4-Phe-Ile-Ala-Trp-Leu-Val-Lys-Gly-Arg-Xaa^5 **(SEQ ID NO 1)**

wherein

Xaa^1 is Ala, Gly, Val, Thr, and Ile;

Xaa^2 is Glu, Gln, Ala, Thr, Ser, and Gly;

Xaa^3 is Lys, and Arg;

Xaa^4 is Glu, Gln, Ala, Thr, Ser, and Gly; and,

Xaa^5 is Gly-OH or is absent;

into said mammal such that it is immunologically isolated from the mammal's immune system substantially as hereinbefore described with reference to any one of the Examples.

17. A vector encoding a protein of SEQ ID NO 1 substantially as hereinbefore described with reference to any one of the Examples.

18. A stable mammalian cell line transformed with a ~~vector capable of secreting~~ a protein of SEQ ID NO 1 substantially as ~~hereinbefore described with reference to any~~ one of the Examples.

(Add B5)